

## **REMARKS**

### **I. Status of the Application and Summary of the Office Action**

This paper is filed in response to the Office Action dated September 8, 2003. Reconsideration of this application is respectfully requested. Claims 1-77 are currently pending in this application. Claims 1-68 and 75-77 have been withdrawn from consideration. Claims 69-74 remain under consideration, and of these claims, 69 is independent. No claims have been cancelled, but withdrawn claims will be cancelled, if necessary, to secure allowance. No new matter is added.

The Office Action rejects claims 69 and 71-74 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,168,737 (Poco et al.). The Office Action cites U.S. Patent 5,930,890 (Chou et al.) as evidence of what is known and common in the art. Applicants acknowledge with appreciation the Examiner's statement that claim 70 would be allowable if rewritten in independent form to include all limitations of the base and intervening claims.

### **II. Summary of the Cited Art**

#### **A. Poco**

Poco pertains to a method for forming and patterning porous dielectrics, particularly for use as electrode spacers in microelectronics applications. See Poco at column 1, lines 12-14. Sheets of a polymeric material are laid on top of a mandrel and pressure is applied to fabricate a negative mold. See Figure 1B of Poco.

Poco discloses using a mandrel as a positive mold made from a hard, refractory ceramic material, such as microcrystalline tungsten carbide, on which minute structures are machined. See Poco at column 2, lines 63-66 and Figure 1A. Poco does NOT teach or suggest depositing a layer of photoresist and photolithographically constructing a positive mold from the photoresist, implicitly or otherwise.

#### **B. Chou**

Chou relates to the field of integrated circuits (IC) chip packaging. See Chou at column 1, lines 8-9. Chou is understood to teach a method of making mounts (interconnect posts) for IC chips wherein the interconnect posts are broader at the base than at the top. See Figure 8 of

Chou. Chou accomplishes this by forming, soft-baking, and exposing a first layer of positive photoresist on a substrate. See abstract of Chou. Without developing the first layer of positive photoresist, a second layer of positive resist is then applied, soft-baked, and exposed over the first layer. See abstract of Chou.

An opening, or aperture, is formed in the photoresist and a plating operation results in the formation in that opening of an integral and generally cylindrical high aspect ratio metallic post. See Chou at column 3, lines 23-29. Chou does NOT disclose using a photoresist layer to form a positive mold.

### **III. The Prior Art Rejections**

Independent claim 69 stands rejected under §103 as being unpatentable over Poco et al. in view of knowledge of one ordinarily skilled in the art. The Office Action acknowledges on page 3 that “Poco does not explicitly disclose that the positive mold is formed by depositing a layer of photoresist.” However, the Office Action argues (as it did in the first Office Action) that using a photoresist layer to form a positive mold is common and known in the art and thus would have been obvious to “avail a proven material.”

In Paper No. 10, Applicants requested the Examiner to cite a reference to demonstrate that “using a photoresist layer to form a positive mold is common and known in the art” of mold making. The present Office Action cites Chou as evidence of this. Applicants respectfully contend that Chou fails to show the use of photoresist to form a positive mold for the following reasons.

#### **A. The Present Application**

The present application discloses a novel method for making molds used for the fabrication of sol-gel spacers. The method for making the molds involves photolithography techniques for the manufacture of a positive mold. See Figure 3A of the present application. A pliable, resilient, reusable negative mold (e.g., latex, silicon, etc.) is formed from the positive mold. See page 5, lines 24-26 of the present application.

**B. Chou is NOT Related to the Art of Mold Making**

The Office Action relies on Chou to show what is known in the art of mold making. However, Chou is unrelated to mold making. Chou relates to integrated circuit chip packaging. The Field of the Invention states, "This invention relates to the field of integrated circuit (IC) chip packaging, and in particular to methods of forming interconnecting posts used to mount IC chips to first level packaging substrates; specifically the forming, with a single development step, of integral shear-resistant posts whose component parts are self-aligned during fabrication." Accordingly, one of ordinary skill in the art of mold making would not have been motivated to look to the art of ICs to improve known methods.

**C. Chou does NOT disclose using Photoresist to form a Positive Mold**

Even if Chou is somehow construed to be an analogous art, Chou does not teach or suggest "using a photoresist layer to form a positive mold," as recited by claim 69 of the present application. Chou does disclose using negative molds made with photoresist (see, e.g. 281, Fig. 5). However, Chou fails to show "using a photoresist layer to form a positive mold." For example, the posts 12 of Fig. 8 are not made of photoresist. The posts 12 are made from a hard, refractory ceramic material, such as tungsten carbide. See Chou at column 2, lines 64-66. As such, claim 69 distinguishes over the cited art.

The additional references cited in the §103(a) rejection of dependent claims 71-74 do not remedy the deficiencies of the Poco and Chou references. Since claims 71-74 depend, directly or indirectly, from independent claim 69, claims 71-74 should be allowed for at least the same reasons provided for claim 69.

**IV. Conclusion**

For at least these reasons, claims 69-74 are believed to define allowable subject matter. An early and favorable examination is earnestly solicited. If there are any remaining issues, the Examiner is urged to contact the undersigned at the telephone number listed below.

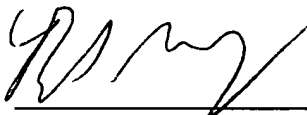
Appl. No.: 09/560,260  
Reply Dated: March 3, 2004  
Office Action of: September 8, 2003

Atty. Docket No. 100718.421 US1 (MIC-79)

The Commissioner is authorized to charge Deposit Account No. 08-0219 the fee of \$770.00 to cover the Request for Continued Examination fee, and \$950.00 to cover the cost of the requested three-month extension of time. No other fees are believed to be due in connection with this paper. However, please charge any fees, or credit any overpayment, that may be due in connection with this paper to Deposit Account No. 08-0219.

Respectfully submitted,

Date: Mar. 3, 2004



Richard A. Goldenberg  
Reg. No. 38,895  
Attorney for Applicants

Hale and Dorr LLP  
60 State Street  
Boston, MA 02109  
Telephone: (617) 526-6548  
Facsimile: (617) 526-5000